

WHAT IS CLAIMED IS:

1. A method of determining the location of a wireless mobile communication device operating in a wireless communication system, comprising:
 - the wireless mobile communication device transmitting a first waveform over a wireless communication link;
 - receiving the first waveform at each of a plurality of known locations;
 - receiving at each of the plurality of known locations a reference waveform produced by a stationary source;
 - for each of the known locations, producing information indicative of a phase difference between the first waveform as received at the known location and the reference waveform as received at the known location; and
 - using said information to determine the location of the wireless mobile communication device.
2. The method of Claim 1, wherein said transmitting step includes the wireless mobile communication device transmitting the first waveform in response to a message transmitted by a further wireless mobile communication device.
3. The method of Claim 1, wherein said first waveform and said reference waveform are periodic waveforms, said producing step including, for each of the known locations, determining a plurality of phase differences between cycles of the first waveform and corresponding cycles of the reference waveform.

4. The method of Claim 3, wherein said producing step includes, for each of the known locations, averaging the associated plurality of phase differences to produce an average phase difference.

5. The method of Claim 4, wherein said producing step includes, for each of the known locations, adjusting the associated average phase difference to produce an adjusted phase difference that accounts for a known phase delay associated with providing the reference waveform from the stationary source to the known location.

6. The method of Claim 5, wherein said producing step includes, for each of the known locations, converting the adjusted phase difference into a quantity of time.

7. The method of Claim 1, wherein said using step includes determining respective distances between the wireless mobile communication device and a plurality of the known locations.

8. The method of Claim 1, wherein the wireless mobile communication device is a Bluetooth device.

9. A method of determining the location of a wireless mobile communication device operating in a wireless communication system, comprising:

the wireless mobile communication device transmitting a first wireless signal at a predetermined transmission power level;

receiving the first wireless signal at a known location and transmitting a second wireless signal from the known location in response to the first wireless signal; and
determining the location of the wireless mobile communication device based on the second wireless signal and the predetermined transmission power level.

10. The method of Claim 9, wherein the second wireless signal includes information indicative of the known location.

11. The method of Claim 9, wherein said step of receiving the first wireless signal includes receiving the first wireless signal at a plurality of known locations, and wherein said step of transmitting a second wireless signal includes transmitting a second wireless signal from each of the plurality of known locations, said determining step including determining that the wireless mobile communication device is located within a predetermined distance of each of the plurality of known locations from which the second wireless signal has been transmitted.

12. The method of Claim 9, wherein said determining step includes determining that the wireless mobile communication device is located within a predetermined distance of the known location.

13. The method of Claim 9, wherein the wireless mobile communication device is a Bluetooth device.

14. The method of Claim 9, including identifying the known location based on the second wireless signal.

15. The method of Claim 14, wherein said identifying step includes the wireless mobile communication device receiving the second wireless signal and identifying the known location based on the second wireless signal.

16. A wireless communication system, comprising:

- a wireless mobile communication device for transmitting a first waveform over a wireless communication link;
- a stationary reference source for producing a reference waveform;
- a plurality of stationary location markers respectively provided at a plurality of predetermined locations for receiving the first waveform, each said location marker coupled to said reference source for receiving the reference waveform;
- each said location marker responsive to the first waveform and the reference waveform for producing information indicative of a phase difference between the first waveform and the reference waveform as received at said location marker; and
- a location determiner coupled to said location markers for receiving said information from said location markers and determining from said information the location of said wireless mobile communication device.

17. The system of Claim 16, wherein said location determiner is coupled to said location markers via a wireless communication link.

18. The system of Claim 16, wherein said location determiner is coupled to said location markers via a wired connection.

19. The system of Claim 16, wherein said reference source includes one of a GPS receiver, an oven-stabilized quartz oscillator, a Cesium atomic oscillator and a Rubidium atomic oscillator.

20. The system of Claim 16, including a further wireless mobile communication device coupled to said first-mentioned wireless mobile communication device via a wireless communication link for requesting said first-mentioned wireless mobile communication device to transmit said first waveform, and wherein said location determiner is provided in said further wireless mobile communication device.

21. The system of Claim 20, wherein the wireless communication link that couples said further wireless mobile communication device to said first-mentioned wireless mobile communication device includes one of said location markers.

22. The system of Claim 16, wherein said wireless mobile communication device and said location markers are provided as Bluetooth communication devices.

23. An apparatus for use in determining the location of a wireless mobile communication device operating in a wireless mobile communication system, comprising:

an input fixed at a known location for receiving a first waveform from the wireless mobile communication device via a wireless communication link;

a second input fixed at said known location for receiving a reference waveform from a stationary source;

a phase comparator coupled to said inputs for determining a phase difference between said first waveform and said reference waveform as received at said inputs; and

an output coupled to said phase comparator for outputting information indicative of said phase difference to a location determiner which can use said information to determine the location of the wireless mobile communication device.

24. The apparatus of Claim 23, wherein said first waveform and said reference waveform are periodic waveforms, said phase comparator operable for determining a plurality of phase differences between cycles of the first waveform and corresponding cycles of the reference waveform.

25. The apparatus of Claim 24, including an averager coupled to said phase comparator for receiving said plurality of phase differences and averaging said phase differences to produce an average phase difference.

26. The apparatus of Claim 25, including a storage section for storing information indicative of a phase delay associated with providing said reference waveform from the stationary source to said second input, and including a phase adjuster coupled to said averager and said storage section, said phase adjuster responsive to said phase delay information and said average phase difference for adjusting said average phase difference to produce an adjusted phase difference that accounts for said phase delay.

27. The apparatus of Claim 23 provided as a Bluetooth device.

28. A wireless mobile communication device, comprising:
an output for transmitting a wireless signal at a predetermined transmission power level;
an input for receiving a wireless response to said wireless signal, said wireless response including information indicative of a location of a source of said response; and
a location determiner coupled to said input and responsive to said information and said predetermined transmission power level for determining a location of said wireless mobile communication device.

29. The wireless mobile communication device of Claim 28, provided as a Bluetooth device.

30. The wireless mobile communication device of Claim 28, wherein said input is for receiving a plurality of wireless responses to said wireless signal, each of said wireless responses including information indicative of a location of a source of said wireless response, said location determiner responsive to said predetermined transmission power level and said information in said plurality of wireless responses for determining the location of said wireless mobile communication device.

31. The wireless mobile communication device of Claim 30, wherein said location determiner is operable for determining that said wireless mobile communication device is located within a predetermined distance of each of the plurality of sources.